

# The librarian as research informationist: a case study\*

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**Question:** How can an embedded research informationist add value to the scientific output of research teams?

**Setting:** The University of California–Los Angeles (UCLA) Louise M. Darling Biomedical Library is an academic health sciences library serving the clinical, educational, and research needs of the UCLA community.

**Methods:** A grant from the National Library of Medicine funded a librarian to join a UCLA research team as an informationist. The informationist meets regularly with the research team and provides

guidance related to data management, preservation, and other information-related issues.

**Main Results:** Early results suggest that the informationist's involvement has influenced the team's data gathering, storage, and curation methods. The UCLA Library has also changed the librarian's title to research informationist to reflect the new activities that she performs.

**Conclusion:** The research informationist role provides an opportunity for librarians to become effective members of research teams and improve research output.

## INTRODUCTION

In April 2011, the National Library of Medicine (NLM) posted a funding opportunity announcement (PA-12-158) seeking proposals for an administrative supplement to add informationists to existing research teams already receiving National Institutes of Health (NIH) funding [1]. One of the seven informationist supplements was awarded to a research team at University of California–Los Angeles (UCLA), and a librarian from the UCLA Louise M. Darling Biomedical Library joined the team as a research informationist in October 2012. This case study reports on early results of this collaboration and discusses potential for librarian/researcher partnerships and the development of the new research informationist role.

Whereas traditional library services have generally focused on the “last mile” or finished product of the research process—the peer-reviewed literature—librarians have expertise that can help researchers create better research output in the form of more useful data. In the last several years, new policies from major funding bodies (such as the National Science Foundation's data management plan requirement and the NIH's public access policy) indicate that funders expect researchers to demonstrate the highest possible return on investment for their grant dollars [2, 3]. The need for better research data management has given rise to a new role for librarians: the “research informationist.” Research informationists work with research teams at each step of the research process, from project inception and grant seeking to final publication, providing expert guidance on data management and preservation, bibliometric analysis, expert searching, compliance with grant funder policies regarding data management and open access, and other information-related areas.

## BACKGROUND AND LITERATURE REVIEW

The UCLA Louise M. Darling Biomedical Library provides services and collections for the health and life sciences community at UCLA, including the Schools of Medicine, Nursing, Dentistry, and Public Health; the Division of Life Sciences; the Ronald Reagan UCLA Medical Center; and the Santa Monica–UCLA Medical Center. In addition to meeting the clinical and educational needs of the community, the UCLA Biomedical Library also supports the research mission of the university. UCLA houses over 290 medical research centers and institutes and received over \$1 billion in research funding in 2011, including over \$350 million in NIH grant funding.

When the NIH informationist supplement was announced, the UCLA Biomedical Library had already been exploring opportunities for supporting e-research, broadly defined as data-intensive research that relies on advanced information technology to facilitate data gathering, analysis, and sharing [4, 5]. The library's participation in the Association of Research Libraries (ARL)/Digital Library Federation (DLF) E-Science Institute in 2011–2012 provided an opportunity to gather information about the state of data management and e-research at UCLA and consider approaches for supporting researchers engaged in these activities [6]. The NIH informationist supplement provided an ideal mechanism for funding a small-scale, single-research-team pilot of services identified as targets to consider in the course of participating in the ARL/DLF E-Science Institute. Specifically, the supplement has allowed the library to explore the research informationist model of providing e-research support by embedding a librarian as an informationist into the research team.

The term “informationist” was first coined in 2000 to describe what the authors considered a new health sciences profession that combined expertise in library and information studies with subject matter expertise

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[7]. Since then, the role of the informationist has been explored in both the library and clinical literature. Though a single model of informationist services has not been clearly defined, most descriptions of the informationist role assume that (1) informationists are “embedded” at the site where patrons conduct their work or need access to information, such as in a hospital, clinic, or research laboratory; and (2) informationists have academic training or specialized knowledge of their patrons’ fields of practice or research [8–13]. This second criterion of specialized knowledge distinguishes the informationist role from the embedded clinical librarian role, though critics have argued that making this distinction undermines the value of the work that clinical librarians had been doing prior to the coining of the informationist term in 2000 [14].

Most explorations of the informationist role specifically discuss the clinical informationist embedded at the point of care with health professionals, but the term has also been expanded to include informationists who work in other settings, including biomedical informationists working with biological and bioinformatics researchers [15, 16], public health informationists, consumer health informationists, and research informationists [10]. An informationist program at the NIH Library, started in 2001, has also served as an early model of the research informationist role [12, 15, 17]. One expected outcome of the NIH informationist supplements is further exploration of this role, as one of the key goals is to assess the impact of the informationist by “characterizing and documenting the value that information expertise brings to research” [1].

## METHODS

NIH RePORTER was searched to identify grantees at UCLA who were eligible to receive the supplement, based on the period of funding, type of funding (eligibility was limited to P01, P30, P50, R01, and U01 activity codes), and institute funding the parent grant (only 8 of the 21 institutes participated as sponsors of the supplement). Of 1,493 active NIH grants at UCLA, 168 were eligible for funding. The librarian screened the research descriptions in NIH RePORTER to identify projects that would likely benefit from the assistance of a research informationist and individually contacted about 70 researchers. In addition, the Office of Research Administration agreed to send out an announcement about the funding opportunity to its email discussion list. These outreach efforts resulted in 6 research teams requesting meetings with the librarian, of which 3 eventually agreed to partner in submitting a proposal.

### The research reference interview

The goal of the meetings with the research teams was to identify areas of need that could be addressed by the librarian’s particular skill set. These meetings could be compared to a reference interview, with

open-ended questioning and negotiation between researcher and librarian. Though the researchers were interested in the possibility of having an informationist, most of them had a limited awareness of the types of services that librarians can offer. Thus, most did not request a specific service, but instead provided an overview of their research and data management practices to the librarian, who then identified gaps or limitations in the researchers’ approach that could be addressed by her particular skill set, including:

- advice on data management and curation, including metadata standards and preservation and preparation of data for sharing;
- expert searching for meta-analyses and systematic reviews; and
- bibliometric analysis and network analysis to identify potential research collaborators.

After meeting with the research teams, the librarian prepared a brief summary of her recommendations for each team. For those teams that agreed to pursue funding, the librarian wrote the proposals independently, based on the prior discussions with the research teams. She also referred to the original proposals for the parent grants, which were provided by the research teams, particularly to write language that addressed how the supplemental funding would assist the teams in meeting the specific aims outlined in the parent grant. Upon completion of the proposals, she submitted drafts to the research teams for their final approval and partnered with each team’s administrative staff to submit the documentation through UCLA’s NIH electronic proposal submission system.

Of the three proposals submitted from UCLA, the project, “Non-Contact, THz Sensing of Corneal Hydration,” was selected as one of seven projects across the United States to receive the NIH informationist supplement. This project investigates the use of terahertz (THz) lasers to measure swelling in the eye. The supplemental funding covers a portion of the informationist’s salary and benefits and provides for her to spend about 30% of a full-time equivalent (FTE) working on the grant project. When working independently on the project, she does so from her office in the UCLA Biomedical Library but typically meets with the researchers in their offices or lab spaces.

### Collaboration with the research team

Upon receiving the NIH informationist supplement, the librarian began to gather more information about the project in order to work more effectively in the role of informationist. The funding proposal had included a general outline of data management activities, but a deeper understanding of the previous work of the research team, the data they had already gathered, and their work-flows for collecting data was essential in planning a more specific set of activities for the informationist to undertake. The research team invited the informationist to join in weekly team meetings, which provided context to

guide the informationist's plans for data management. Attending the meetings was especially useful because the informationist did not have any formal subject matter training or specific subject expertise beyond advanced science courses at the undergraduate level.

Through a combination of discussions with the research team, observations of the researchers' data gathering and analysis processes, and the informationist's research into the field of THz research, a set of initial challenges was targeted as the focus of the informationist's intervention:

- digitize the team's existing paper lab notebook of handwritten results of the previous four years' research;

- aggregate disparate sources of data about the same experiment, such as metadata from the THz device, histology images and reports, proteomics data, photographs of the experimental set up, and the THz image; and

- create metadata standards for the emerging field of research into medical and other applications for THz.

As with the initial research reference interview prior to submitting the proposal, the collaboration between the informationist and the research team has progressed as a negotiation or conversation, with each party bringing a unique set of expertise, knowledge, and assumptions. Rather than following a strict schedule, the collaboration between the informationist and the research team has evolved as an iterative process, with the informationist proposing solutions to problems and the team suggesting how these solutions could be applied to their research. For example, when the informationist suggested that the research team create a metadata standard to describe THz data, one of the research team members asked if the Digital Imaging and Communications in Medicine (DICOM) standard could be applicable. Upon further investigation, the informationist determined that DICOM provided an ideal starting point from which to adapt a standard for THz. With the informationist providing guidance in best practices and the researchers suggesting options that they thought would meet the requirements of the informationist's recommendations, a number of goals were identified and potential solutions proposed, providing a plan for the two-year-long project.

Though it is likely that the specifics of the project plan will continue to evolve as the collaboration between the informationist and research team progresses, goals for the project include:

- provide the team with guidance on best practices for data preservation, such as automated backup and storage redundancy;

- design or adapt a metadata standard to provide context for existing data and guide future data gathering in the field of THz imaging; and

- create solutions for aggregating data from disparate sources and more efficiently gathering data, while maintaining a workflow as similar to the team's existing practices as possible.

## RESULTS

Preliminary results from the first several months of the two-year grant are promising, suggesting that the researcher/informationist collaboration is mutually beneficial and that the informationist does add value to the research process. Early efforts in the grant have focused on addressing easily achievable goals, such as providing basic instruction in best practices for data management for the research team and assisting the team with preserving its existing digital data. The researchers and informationist are also collaborating on plans for more substantive projects to enhance the team's data gathering and management work-flows.

Shortly after the collaboration began, the research team requested the informationist's assistance with writing a data management plan (DMP) for a National Science Foundation grant that would investigate the use of the same THz technology in additional, nonmedical applications. The informationist provided guidance on how to prepare an appropriate plan using the DMP Tool [18]. As a result of their earlier collaboration, the research team included the informationist as key personnel in the National Science Foundation grant, requesting 0.6 calendar months of funding for the informationist to provide data management guidance on the new project. Though quantitative data regarding the value added to the research team by the informationist have not yet been gathered, inclusion of the informationist on this new grant provides an early indicator that the investigators consider the informationist's involvement with the research team to be worthwhile.

The NIH informationist supplement project has also provided a useful model for how the library can provide sustainable informationist services to support the research mission of the university. Early successes with the project have also demonstrated the value of informationist services at the UCLA Biomedical Library. In February 2013, the informationist's functional job title was changed from health and life sciences librarian to research informationist, reflecting the library's interest in expanding its service offerings for supporting data management and e-research. In addition to her liaison librarian responsibilities to academic and clinical departments, the research informationist collaborates with the library's Council on Library and Information Resources/Sloane post-doctoral fellow in data curation and other librarians interested in data management to assess the data needs of researchers on campus. She also provides instruction on data management, the NIH public access policy, and other research-related areas and plans for other activities to support researchers in the health, life, and physical sciences.

## DISCUSSION

As grant funders, particularly federal institutions, increasingly call for researchers to provide a high level of return on investment and scientific transparency by sharing their data, libraries have an oppor-



tunity to provide valuable assistance to research teams. Many researchers do not have formal training or expertise in data management, making it difficult for them to meet funder requirements for data sharing. While much attention has been focused on "big data," it is often smaller research labs that need help with managing their data yet lack adequate funding to hire full-time data managers. These small-to-medium-sized research teams could greatly benefit from librarians' expertise in organization and description of information, long-term preservation, and expert searching. Such collaborations with librarians can significantly enhance the scientific research process.

The movement of librarians into new informationist roles has significant implications for the training of information professionals. To effectively address the needs of researchers and provide a full portfolio of research support services, the informationist must have knowledge of data management and preservation, funder policies and requirements, and grant writing. Informationists should also possess skills traditionally associated with medical and science librarians, including expert searching, information literacy instruction, and selection of information resources to support the research needs of the institution. Many programs that offer an American Library Association-accredited master's degree provide such training for the next generation of librarians and informationists. For librarians in the workforce, a variety of continuing education and ongoing training programs provide opportunities for acquiring new skills. Examples include "Curating and Managing Research Data for Re-Use," offered by the Interuniversity Consortium for Political and Social Research (ICPSR) and taught by staff from ICPSR and Stanford and Purdue libraries [19]; and the week-long biomedical informatics course taught twice yearly at the Marine Biological Laboratory by NIH and NLM staff [20].

Although the classic definition of informationist typically includes the requirement of subject matter knowledge, based on this informationist's experience, the research informationist does not necessarily need to hold an advanced degree in a scientific subject to be successful. However, the informationist should be willing to become educated in the basics of the collaborators' research to work effectively with the research team. Perhaps more importantly, the informationist should be familiar with the community of practice within which researchers work. Practitioners in different scientific fields have different attitudes about data sharing, converse with their own specialized jargon, and often have unique shared perspectives about the practice of their particular forms of science.

In addition to the benefit that informationist services provide researchers, libraries should also consider how grant funding opportunities will allow them to expand their services. Given that the current fiscal climate requires libraries to think carefully about how to budget their limited resources, informationist collaboration

with grant-supported research teams could represent a significant funding source for offsetting salaries for informationists. Librarians working in informationist roles should continue to quantitatively and qualitatively establish the impact of their services to demonstrate their value to researchers who are considering including an informationist in their funding proposals. Principles of library instruction evaluation can be applied to informationist services to assess the knowledge and skills that researchers gain by working with informationists. Other outcomes associated with researchers' output, such as increased article citations and better-described datasets, can also indicate the value of informationist services.

## CONCLUSION

The clinical informationist model of delivering expert guidance to patrons at their sites of practice can be effectively applied to the needs of health and life sciences researchers. This initial collaboration suggests that the research informationist can become a valuable and even essential member of the research team, particularly as funder requirements for data sharing become more stringent. Libraries should consider how they can prepare their staff to address the challenge of providing specialized services to researchers, as well as explore funding opportunities to create sustainable research informationist programs to support the information needs of researchers at their institutions.

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